

Tree Sentinels Help Monitor Citrus Canker

Asiatic citrus canker (ACC) is thought to have arrived in Florida in 1992 or 1993 and has already claimed more than a million commercial and residential citrus trees. A joint federal-state Citrus Canker Eradication Program removes and destroys infected trees while scientists search for new ways to stop this bacterial threat to Florida's \$8.5-billion citrus industry. Florida produces 75 percent of U.S. citrus. Worldwide, the United States is second only to Brazil in citrus fruit production.

ARS researchers at the U.S. Horticultural Research Laboratory in Fort Pierce, Florida, led by plant pathologist Timothy R. Gottwald, have developed an early-warning system for spotting new outbreaks. It uses a sentinel tree grid to detect and help prevent the further spread of ACC into major citrus production areas along the state's eastern central coast.

"The grid is formed by dividing each square mile into a 12-by-12 grid of 144 subsections. A sentinel tree is selected for repeated survey in each subsection," explains Gottwald.

ACC moves primarily by wind-driven rain and raises brown blemishes surrounded by an oily, yellow margin on citrus leaves and fruit. It causes fruit to drop prematurely and lowers yields and quality. It can lead to a loss of markets due to quarantines on the transport, sale, and export of fruit from affected areas.

The lime industry in south Florida—the only place in the United States where limes are grown commercially—has been hardest hit. Early this year, 1,539 of the 3,000 acres of lime groves surveyed tested positive for ACC or were exposed to the disease, according to the Florida Department of Agriculture and Consumer Services. About 4,500 total citrus acres have been destroyed throughout Florida so far.

"The sentinel tree grid is currently being implemented across the state in high-risk residential areas such as Miami, where the most recent outbreaks have occurred," says Gottwald.

By visually surveying the 1-mile-square gridded areas every 30 days, researchers can identify new outbreaks and destroy infected trees quickly. "The tree grid has helped us detect a number of new infections that otherwise wouldn't have been found as early," says Gottwald.—By **Jesús García**, ARS.

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Got Weeds? Breed Sheep!

Rambouillet sheep prefer mountain big sagebrush over many other types of rangeland plants, ARS researchers have found. And it's not just in their taste buds—it's in their genes.

"Other scientists have found genetic influences on diet preference in mice, goats, cattle, and people," says ARS geneticist Gary D. Snowder. "Now we've found that heredity also plays a role in the sheep's preference for sagebrush." Snowder works at ARS' U.S. Sheep Experiment Station in Dubois, Idaho.

The genetic findings may eventually give producers another tool for better using rangeland forage.

"If we can breed sheep to favor specific plants, we could help both the animals and the environment," Snowder says. For example, breeding animals so that they prefer an especially nutritious feed could enhance production. Or the sheep could be bred to prefer invasive weeds. They already eat some, like leafy spurge.

Snowder and colleagues from the University of Idaho, Texas A&M University in San Angelo, and the ARS Meat Animal Research Center in Lincoln, Nebraska, analyzed the foraging preferences of sheep from September to October in 1996 and 1997. Their discovery of a sagebrush preference could benefit land managers.

"Sagebrush is a common plant, covering at least 100 million acres of western rangeland. Although it is a native plant, it is viewed in some areas as invasive and undesirable," he says.

Snowder says it's likely that other dietary preferences of sheep also have a genetic component. If sheep can be used more extensively to control exotic weeds, they could help reduce the takeover of native habitat. The U.S. Department of the Interior estimates that invasive plants and weeds spread over federal lands at a rate of 4,600 acres per day.—By **Kathryn Barry Stelljes**, ARS.

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